**Light scattering by moving photonic crystals and dynamical Casimir effect**

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We report on light scattering by photonic crystals moving with a constant velocity in the direction of its spatial periodicity. When a plane-wave is incident on the photonic crystal, its frequency and momentum components parallel to the boundary are shifted by the Umklapp scattering. In addition, it induces the radiation pressure as well as the acceleration or deceleration force acting on the photonic crystal. The work done for moving the photonic crystal against the deceleration force is shown to be the net flux of the induced radiation minus that of the incident radiation, provided that there is no absorption loss in the photonic crystal. This phenomenon can be regarded as a classical counterpart of the dynamical Casimir effect. The net flux generally increases with increasing velocity, so that high emission efficiency can be achieved with a relativistic motion of the photonic crystal. Moreover, the efficiency is strongly enhanced by the excitation of the photonic bands.

We will present these results and discuss their implication for the quantum friction and the dynamical Casimir effect[1].

[1] J.B. Pendry, *J. Phys.: Condens. Matter* 9, 10301 (1997).